

Name _____

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Quiz 4

September 11, 2002

A normalized Gaussian centered at x_0 with variance $(\Delta x)^2$ is described by

$$G(x; x_0, \Delta x) = (2\pi)^{-1/2} (1/\Delta x) e^{-(x-x_0)^2/[2(\Delta x)^2]}.$$

- A. What is the value of the Gaussian function at linecenter, $x = x_0$?
- B. What kind of function is $[G(x; x_0, \Delta x)]^2$?
- C. What is the variance of $[G(x; x_0, \Delta x)]^2$?
- D. What is the center value of k (i.e., k_0) and the variance of k for $\Psi(x, 0) = (31)^{-3/4} \int_{-\infty}^{\infty} e^{-(49/9)(k-5)^2} e^{ik(x-2)} e^{i5} dk$?
- E. What is the center value of x (i.e., x_0)?